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THE SPHAERIIDAE, A PRELIMINARY SURVEY

BY STANLEY TRUMAN BROOKS AND H. B. HERRINGTON

Although Temple Prime, Dr. Victor Sterki and others have paid much attention to the taxonomy of the *Sphaeriidae*, that group is in a chaotic state. Identifications are difficult or impossible.

Not only have the present students found the *Sphaeriidae* to be an exasperating portion of our fauna but, also, Dr. Sterki has long put his complaints into writing. Writing to Chief Justice Latchford, Sterki made the following comment, "It is hardly necessary to offer you excuse or explanation for doubtfully identified forms, as in the list; you certainly understand that "species" are not always "clear cases." Some of our *Sphaeriidae* are so perplexingly variable that it is impossible, at present, to outline them, or more practically, to know whether a given "form" is inside or outside that limit. One of the most difficult is e.g., *Sphaerium striatinum*, with apparently no end of variation, or varieties and local forms; similar cases are those of *M. securis*, *rosaceum*, *truncatum*, and a number of *Pisidia*." Nineteen years later (January 10, 1930), writing to the same individual as he returns material he has been examining, Dr. Sterki writes in the same vein: "Most of the spp. are very variable and some are very difficult to define and confine, e.g. *striatinum*, *stamineum*, even *solidulum*." And these statements can be duplicated many times from Sterki's notes in the Carnegie Museum.

A comprehensive programme of research should include:

1 (a) A re-study of all shell characters, especially hinge teeth, general shape, the young, etc., of both recent and fossil forms.

(b) Comparison with the original descriptions.

2 Preparation of clear descriptions and good figures of each species.

3 Anatomical investigations.

As a first step in this direction these preliminary remarks are offered.

The authors have been gathering data about the larger eastern forms of the family *Sphaeriidae* (genera *Sphaerium*, *Musculium*), and have found the following principles involved:

1. That the myriad forms hitherto placed under the genera *Sphaerium* and *Musculium* are generalized groups and/or, in some cases, species which are even today still undergoing evolutionary development. The generalized forms are exactly represented by the groups *Sphaerium sulcatum* and *Sphaerium striatinum*, both of which form a complex evolutionary structure of interrelated (ecological and geographical) units.

2. That the genus (so called) *Musculium* is in reality a division of the genus *Sphaerium*, and cannot be separated, on the basis of conchological characters, from that genus. In this statement we are in harmony with older American and European opinion. The calyculae of the shells are not a character of generic standing. It is noted, however, that in this genus a further speciation has taken place than within the genus *Sphaerium* (in the strict sense).

3. That the species *Sphaerium rhomboideum*, *Sphaerium walkeri*, *Sphaerium occidentale*, and *Sphaerium corneum* form a separate group belonging together. These have been included by Dr. Victor Sterki in the "*corneum* group." They impress one as a group of true species rather than as a species with variations. They are all loosely linked together by the embryonic forms, however.

4. That the *sulcatum* complex is distinguished by the uniform striae and the shape and large size of the embryonic specimens. In all these species (so called) the similarity of the very young and unborn shells is a striking feature. One can trace the development of these into the various described kinds, but funda-

mentally they form (the embryos) one group. The following are forms of *sulcatum*:

<i>S. sulcatum</i> Lam.	<i>S. sulcatum planatum</i> St.
" " <i>insigne</i> St.	" " <i>decisum</i> St.
" " <i>albescense</i> St.	" " <i>lineatum</i> St.
" " <i>fallax</i> St.	" " <i>crassum</i> St.
" " <i>dakotense</i> St.	" " <i>ellipticum</i> St.
" " <i>obscurum</i> St.	" " <i>sculptum</i> St.

5. That *Sphaerium striatinum* (as a group) is distinguishable from the others by the more widely spaced striae (when striae are present, specimens may be smooth or heavily striated), and by the shape of the embryos; i.e., although the texture of the shell is the same in *sulcatum* and *striatinum*, if you take an embryo of the same size from each of these the dorsal margin of the *sulcatum* will be straight, that of *striatinum* will be somewhat bent downward in front of the beak. This make *striatinum* less equilateral in shape. Even though one can see the first steps toward speciation within this group the indefinite limits of variation are not sufficiently stable to constitute ascertainable species. The following are forms of *striatinum*:

<i>S. striatinum</i> Lam.	<i>S. lilycashense</i> Baker
" " <i>corpulentum</i> St.	<i>S. wrighti</i> St.
" " <i>modestum</i> St.	<i>S. solidulum</i> Prime
" " <i>badium</i> St.	<i>S. canadense</i> St.
" " <i>rugosum</i> St.	<i>S. bakeri</i> St.
" " <i>solidum</i> St.	<i>S. torsum</i> St.
" " <i>decorum</i> St.	<i>S. emarginatum</i> Prime
" " <i>novangliae</i> St.	<i>S. wisconsinense</i> St.
" " <i>tenerum</i> St.	<i>S. altile</i> St.
" " <i>attenuatum</i> St.	<i>S. pilsbryanum</i> St.
" " <i>levissimum</i> St.	<i>S. hendersoni</i> St.
<i>S. stamineum</i> Conrad	<i>S. declive</i> St.
" " <i>forbesi</i> St.	<i>S. obtusum</i> St.
" " <i>laeve</i> ?	<i>S. browni</i> St.
<i>S. notatum</i> St.	<i>S. concinnum</i> St.
" " <i>gibbosum</i> St.	<i>S. elegans</i> St.
" " <i>glabrum</i> St.	<i>S. vermontanum</i> Prime
<i>S. acuminatum</i> Prime	<i>S. ornatum</i> St.
" " <i>diaphanum</i> St.	<i>S. regulare</i> St.
" " <i>lacuum</i> St.	<i>S. cerinum</i> St.
<i>S. cumberlandicum</i> St.	<i>S. redense</i> St.
<i>S. nylanderi</i> St.	<i>S. laevigatum</i> St.
<i>S. eminens</i> St.	<i>S. ohioense</i> St.

6. That the *Musculia* (*Musculium*) stand close to the *corneum* group. The fine texture of the shell is much the same, and very unlike that of *sulcatum* or *striatinum* which is coarser. Most of the *Musculia* are also markedly more fragile than the *Sphaeria*. But the tougher forms are as rugged as *Sphaerium walkeri* St. When one studies the entire group, neither by means of adult characters nor young specimens can one determine where one "species" leaves off and another begins (within this "genus"). Mr. Herrington has found that by taking the extreme forms of *Musculia* and placing them along with the less extreme that they "fit together like the pieces of a puzzle." One might say that this group is on the verge of speciation but still retains too many of the general characteristics to be divided successfully now.

The Pittsburgh member of this present survey feels that perhaps we have been too greatly overshadowed by the complex in our comprehension of the *Sphaeriidae*. Perhaps it is simply a case of great simplicity—a few groups widely dispersed and extremely variable. At any rate this represents our present outlook. We are seeing some light—the more light as we see more and more relationships within the mass of specimens. Each major group is found to have a pattern of distribution and a pattern of anatomical features which will undoubtedly lead to the proper vision of this vast complex of animal life.

To assist us in this work we are asking fellow conchologists to make an especial effort at collecting both Pleistocene and recent material. The Pleistocene picture we hope will be the secret door to the apparent present day complexity of the group. There, we hope, will our simplification be more strongly illustrated—the pattern more broadly illuminated. Today, and with the specimens of today's evolution we are laboring under a burdensome mass of observation and speculation freighted with misconceptions and fallacies.

We ask that each collector will please give data—date, elevations, flood condition, watershed, lake, or stream, etc., with specimens sent in.

It may be interesting to others to know that the Carnegie Museum is keeping the Sterki Collection intact under the names Sterki used. Only a small portion has been removed and renovated for this study. We still need collections from many areas

and especially from the Pleistocene. Wherever the older (and some of the present) collectors live or have lived, that area is usually well represented in our cabinet. The newer students of mollusks can greatly extend our range of material into newer fields.

Specimens may be sent to Dr. Stanley Truman Brooks, Carnegie Museum, Pittsburgh, Pa., or to the Rev. H. B. Herrington, Newburgh, Ont., Canada.

A NEW *VITRINELLA* FROM MARYLAND¹

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Among the numerous mollusks that Dr. S. F. Blake has found in his researches on the Pleistocene fauna of Maryland is this small *Vitrinella* that seems to be undescribed, and which I am pleased to name for the discoverer.

VITRINELLA BLAKEI, new species. Plate 9, Figures 1, 2.

Shell very small, depressed-helicoid, with a low spire, opaque white. The last whorl is large, strongly convex, and sculptured on the upper surface by well-defined, short, axial wrinkles of varying length, running down from the suture, and stronger, more crowded ones around the deep narrow umbilicus; there are likewise numerous fine spiral grooves in the peripheral region. Aperture suborbicular, flattened somewhat in the columellar portion and bluntly angled at the base thereof.

The type, U.S.N.M. No. 537834, measures: Height, 0.7 mm.; greatest diameter, 1.2 mm.

It was collected in Bed 1 (lowest bed) of the Talbot formation of the Pleistocene at Wailes Bluff, near Cornfield Harbor, at the southern tip of St. Mary's County, Maryland.

The axial wrinkles in the umbilical and sutural region, and the narrow umbilicus, will distinguish this species from other West Atlantic forms. It will very likely be found to be also living along our coast.

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